



Public Schools of North Carolina

State Board of Education | Department of Public Instruction

This document is designed to help North Carolina educators teach the Common Core. NCDPI staff are continually updating and improving these tools to better serve teachers.

7th Grade Math Curriculum Crosswalk

The following document is to be used to compare the 2003 North Carolina Mathematics Standard Course of Study and the Common Core State Standards for Mathematics.

As noted in the Common Core State Standards for Mathematics document, the instructional time in Grade 7 should focus on four critical areas:

- (1) developing understanding of and applying proportional relationships;
- (2) developing understanding of operations with rational numbers and working with expressions and linear equations;
- (3) solving problems involving scale drawings and informal geometric constructions, and working with two- and three-dimensional shapes to solve problems involving area, surface area, and volume; and
- (4) drawing inferences about populations based on samples.

To download the Common Core State Standards, please visit <http://www.corestandards.org/the-standards>.

Important Note: The current SCoS will continue to be the taught and tested standards in the 2010-11 and 2011-12 school years. We expect the new Common Core standards to be taught and assessed in schools for the first time in the 2012-13 school year. That said, we are providing resources now and over the next two-years so that schools and teachers can get a head start on internalizing and planning to teach the new standards.

NC SCOS			Common Core			Comments
Strand	Objective	Text of objective	Domain	Standard	Cluster	
Numbers & Operations	1.01	Develop and use ratios, proportions, and percents to solve problems.	Ratios & Proportional Relationships	7.RP.1	Analyze proportional relationships and use them to solve real-world and mathematical problems.	
					Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. <i>For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.</i>	
			Ratios & Proportional Relationships	7.RP.2.a	Analyze proportional relationships and use them to solve real-world and mathematical problems.	Common Core emphasizes the use of graphs and ratio tables to determine proportional relationships.
					Recognize and represent proportional relationships between quantities. a) Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.	
				7.RP.3	Analyze proportional relationships and use them to solve real-world and mathematical problems.	These examples include percent error which is new to 7 th grade.
					Use proportional relationships to solve multistep ratio and percent problems. <i>Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.</i>	

NC SCOS			Common Core			Comments
Strand	Objective	Text of objective	Domain	Standard	Cluster	
					Text of objective	
	1.02	Develop fluency in addition, subtraction, multiplication, and division of rational numbers. a) Analyze computational strategies. b) Describe the effect of operations on size. c) Estimate the results of computations. d) Judge the reasonableness of solutions.	Number System	7.NS.1	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. a) Describe situations in which opposite quantities combine to make zero. <i>For example, a hydrogen atom has zero charge because its two constituents are oppositely charged.</i> b) Understand $p + q$ as the number located a distance $ q $ from p , in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. c) Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts. d) Apply properties of operations as strategies to add and subtract rational numbers.	

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Strand	Objective	Text of objective	Domain	Standard	Cluster
					Text of objective
					Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.
					Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.
					a. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
					b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real world contexts.
	1.03	Develop flexibility in solving problems by selecting strategies and using mental computation, estimation, calculators or computers, and paper and pencil.	Number System	7.NS.2	c. Apply properties of operations as strategies to multiply and divide rational numbers.
				7.NS.3	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.
					Solve real-world and mathematical problems involving the four operations with rational numbers. ¹
					¹ Computations with rational numbers extend the rules for manipulating fractions to complex fractions.

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			Expressions & Equations	7.EE.3	<p>Solve real-life and mathematical problems using numerical and algebraic expressions and equations.</p> <p>Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. <i>For example: If a woman making \$25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or \$2.50, for a new salary of \$27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.</i></p>	
			Ratios & Proportional Relationships	7.RP.2	<p>Analyze proportional relationships and use them to solve real-world and mathematical problems.</p> <p>Recognize and represent proportional relationships between quantities.</p> <p>b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.</p> <p>c. Represent proportional relationships by equations. <i>For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as $t = pn$.</i></p>	<p>Moved from Algebra I (direct variation) NC SCOS.</p> <p>These standards bridge work in 6th grade with ratios and unit rates to slope in 8th grade.</p>

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			Ratios & Proportional		d. Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where r is the unit rate.	
			Number System	7.NS.2.d	<p>Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.</p> <p>Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.</p> <p>d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.</p>	
Measurement	2.01	Draw objects to scale and use scale drawings to solve problems.	Geometry	7.G.1	<p>Draw, construct, and describe geometrical figures and describe the relationships between them.</p> <p>Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.</p>	
	2.02	Solve problems involving volume and surface area of cylinders, prisms, and composite shapes.	Geometry	7.G.6	<p>Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.</p> <p>Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.</p>	This standard includes pyramids since they are composed of triangles, quadrilaterals and polygons. Also includes composite shapes composed of cubes and right prisms. It does not include cylinders.

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				7.G.4	Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.	Moved from 6 th grade NC SCOS.
				7.G.5	Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.	
Geometry	3.01	Using three-dimensional figures:				
		a) Identify, describe, and draw from various views (top, side, front, corner).				
		b) Build from various views.				
		c) Describe cross-sectional views.				
			Geometry	7.G.3	Draw, construct, and describe geometrical figures and describe the relationships between them. Describe the two-dimensional figures that result from slicing three dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.	
	3.02	Identify, define, and describe similar and congruent polygons with respect to angle measures, length of sides, and proportionality of sides.				Moved to 8 th grade Common Core.

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	3.03	Use scaling and proportional reasoning to solve problems related to similar and congruent polygons.				Moved to 8 th grade Common Core.
			Geometry	7.G.2	Draw, construct, and describe geometrical figures and describe the relationships between them. Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.	New to 7 th grade.
Data Analysis & Probability	4.01	Collect, organize, analyze, and display data (including box plots and histograms) to solve problems.				Moved to 6 th grade Common Core.
	4.02	Calculate, use, and interpret the mean, median, mode, range, frequency distribution, and inter-quartile range for a set of data.				Moved to 6 th grade Common Core; however, frequency distribution is not specifically addressed in the Common Core standards.
	4.03	Describe how the mean, median, mode, range, frequency distribution, and inter-quartile range of a set of data affect its graph.				Moved to 6 th grade Common Core.
	4.04	Identify outliers and determine their effect on the mean, median, mode, and range of a set of data.				Moved to High School Common Core.

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	4.05	Solve problems involving two or more sets of data using appropriate statistical measures.	Statistics & Proportional Relationship	7.SP.4	Draw informal comparative inferences about two populations. Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. <i>For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.</i>	
				7.SP.1	Use random sampling to draw inferences about a population. Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.	New to 7 th grade.
			Statistics & Proportional Relationship	7.SP.2	Use random sampling to draw inferences about a population. Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. <i>For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.</i>	New to 7 th grade.

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				7.SP.3	Draw informal comparative inferences about two populations. Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. <i>For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.</i>	New to 7 th grade.
			Statistics & Proportional Relationship	7.SP.5	Investigate chance processes and develop, use, and evaluate probability models. Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around $\frac{1}{2}$ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.	Moved from 6 th grade NC SCOS.
				7.SP.6	Investigate chance processes and develop, use, and evaluate probability models. Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. <i>For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.</i>	Moved from 6 th grade NC SCOS.

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			Statistics & Proportional Relationship	7.SP.7	Investigate chance processes and develop, use, and evaluate probability models. Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.	Moved from 6 th grade NC SCOS.
					a) Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. <i>For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.</i>	New to 7 th grade.
				b) Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. <i>For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?</i>	Moved from 6 th grade NC SCOS.	
				7.SP.8	Investigate chance processes and develop, use, and evaluate probability models. Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.	
			a) Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.		Moved from 6 th grade NC SCOS.	

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					b) Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event.
			Statistics & Proportional		c) Design and use a simulation to generate frequencies for compound events. <i>For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?</i>
Algebra	5.01	Identify, analyze, and create linear relations, sequences, and functions using symbols, graphs, tables, diagrams, and written descriptions.			
	5.02	Translate among different representations of algebraic expressions, equations and inequalities.	Expressions & Equations	7.EE.1	Use properties of operations to generate equivalent expressions. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
	5.03	Use and evaluate algebraic expressions, linear equations or inequalities to solve problems.		7.EE.4	Solve real-life and mathematical problems using numerical and algebraic expressions and equations. Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

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					Text of objective	
					a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p , q , and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. <i>For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?</i>	
			Expressions & Equations		b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p , q , and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. <i>For example: As a salesperson, you are paid \$50 per week plus \$3 per sale. This week you want your pay to be at least \$100. Write an inequality for the number of sales you need to make, and describe the solutions.</i>	
	5.04	Develop fluency in the use of formulas to solve problems.				Moved to 6 th grade Common Core.
			Expressions & Equations	7.EE.2	Use properties of operations to generate equivalent expressions. Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. <i>For example, $a + 0.05a = 1.05a$ means that "increase by 5%" is the same as "multiply by 1.05."</i>	New to 7 th grade.